Child Death Review State Committee Recommendations on

Child Drowning Prevention

June 2004

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Improving the health and safety of all our children …

This report makes recommendations for the prevention of drowning deaths to children. It is the fourth in a series of reports on prevention of fatal injuries in childhood, using data from reviews of child deaths between 1999 and 2001. An average of 765 Washington State children die each year. Hundreds of these deaths could be prevented through the implementation of statewide and local prevention strategies.

The Washington State Child Death Review (CDR) Committee reviewed data gathered by local CDR teams to identify trends and prevention strategies for the entire state. Workgroups made up of committee members and other experts identified data trends, reviewed literature, and examined existing prevention activities. The results of their efforts are the statewide prevention recommendations described in this report. The recommendations are intentionally directed at a broad range of agencies and organizations as well as the public. A multi-directional approach is needed if we are to reduce the incidence of drowning deaths among Washington's children.

Based on this information, the CDR State Committee makes the recommendations on the pages that follow. The committee encourages a variety of stakeholders, including parents and caregivers, educators, healthcare leaders, community organizations, and law enforcement, to help implement these recommendations. By working together we can improve the health and safety of all our children.

Other reports in this series:

"Child Firearm Death Prevention." December 2003

"For All Our Children: Preventing SIDS and Motor Vehicle Crash Deaths." March 2003

"Washington State Child Death Review Program Progress Report." May 2001

Key Recommendations:

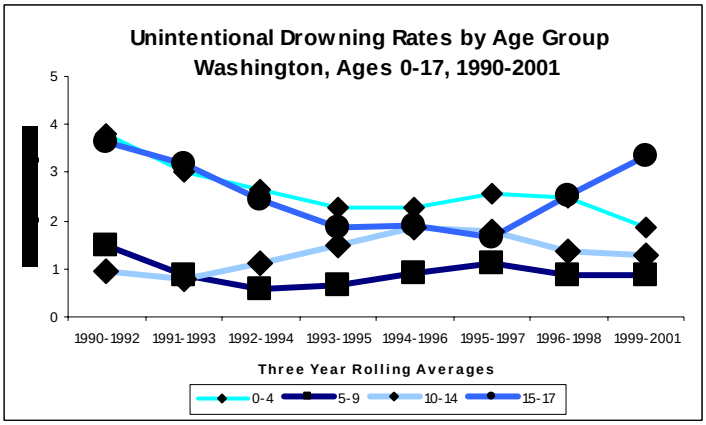
1. Increase life jacket use and supervision of children and adolescents in or near the water.
2. Create physically safe water environments.
3. Encourage policies and regulations that emphasize water safety.
4. Raise community and personal awareness of child and teen drowning risk factors and prevention/safety strategies.
5. Support standardized drowning death investigation procedures and improve data collection efforts.

Background

An average of 27 Washington State children ages 0–17 years drown each year. Drowning is the second leading cause of unintentional injury death for children in Washington.[1,2] Nationally, children ages 1–4 years are at the greatest risk among children ages 0–17 years for drowning;[3] however, Washington's childhood drowning rates are highest for youth ages 15–17 years followed by children ages 1–4 years.[1]

Some of the survivors of drowning, especially children, are severely brain damaged due to lack of oxygen during submersion. Some survivors live in a persistent vegetative state. Further, the medical care costs for drowning survivors in the United States are greater than one-half billion dollars annually.[5]

Table 1: Washington Unintentional Drowning Rate by Age Group[4]



There were 80 deaths of Washington children ages 0–17 years from 1999 through 2001 in which drowning was listed as the primary cause of death.[1] As of December 2002, local CDR teams had reviewed 77 of those deaths.

The CDR State Committee evaluated data from 67 of the reviewed deaths; the remaining 10 were either vehicular-related drowning deaths or lacked data on the drowning event and are not included in this report.[6]

Based on their analysis of the 67 deaths, the CDR State Committee identified 5 key recommendations to prevent child drowning deaths in Washington.

Recommendation #1: Increase life jacket use and supervision of children and adolescents in or near the water

Key Findings:

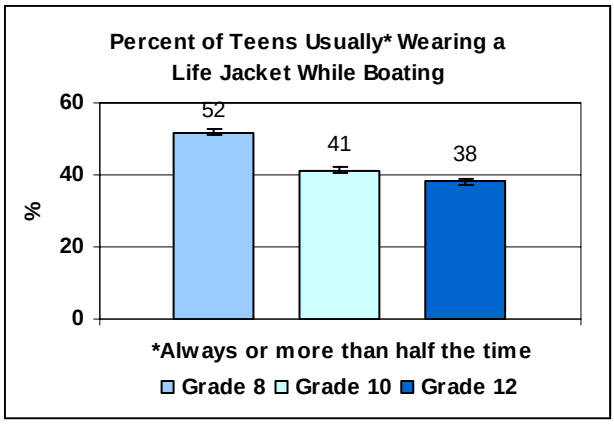
- Only two of the 67 children who drowned were wearing a life jacket. In one of those two deaths the life jacket did not fit the child. In the second death, although there was a life jacket, there is no information on the type or fit of the jacket. None of the children on boats who drowned were wearing a life jacket.
- A lifeguard was present in only three of the drowning deaths. For the seven deaths that occurred in a swimming pool or wading pool, a lifeguard was present in only one of the deaths.
- An adult (17 years or older), a parent, or lifeguard was present in thirty-three of the forty cases (83 percent) when children ages *14 years and under* drowned. For the remainder of the deaths of children under age 14, four were supervised by other children and three were not supervised at the time of their drowning.
- One-third of the teens who drowned were not with adults but were with other teens at the time of their drowning.
- Three of the 67 drowning deaths were intentional (suicide or homicide). Of the remaining 64 drowning deaths, which were either unintentional or undetermined, 26 (41%) were swimming or playing in the water right before they drowned; 17 (27%) were playing or sitting near the water; 10 (16%) were boating, rafting, or on an innertube; 7 (11%) were in a bathtub; two (3%) fell through ice on a pond; and for the remaining two (3%), their activity was unknown.
- One-third of all the childhood drowning deaths reviewed occurred in parks.

Increase Proper Life Jacket Use In and Around the Water

Promote the use of life jackets (personal flotation devices) while engaged in activities (including swimming and boating) in, on, or around any open water situations and swimming techniques to accommodate wearing personal flotation devices (PFD).

U.S. Coast Guard approved life jackets that are appropriate for the activity, properly fitted, and worn correctly are likely to increase a child's chance for surviving in the water. The standard for wearing life jackets should be expanded to include times when a child *might be* in the water, regardless of whether they intend to get into the water. Many of the children were not swimming at the time of drowning but were playing in or near the water or boating.

Figure 2: Percent of Teens Reporting Wearing a Life Jacket While Boating



Data from the 2002 Healthy Youth Survey show that about half of students in Grade 8 reported wearing a life jacket more than half the time while boating. By Grade 12, about 4 out of 10 reported wearing a life jacket while boating.[7]

Life jacket use while swimming in open water could also reduce the risk of child drowning deaths. Swimmers may believe that they can manage a longer distance than is realistic. Further, they may not be prepared for exposure to the conditions of open water, including cold temperatures, waves, and currents. Life jackets can offer children vital support until help can reach them.

Current Washington State laws related to lifejacket use include RCW 79A.60.160 (1), which states, "No person may operate or permit the operation of a vessel on the waters of the state without the use of personal flotation device on board for each person on the vessel. Each PFD shall be in serviceable condition, or an appropriate size and readily accessible." Additionally, RCW 79A.60.160 (4) requires PFDs to be worn by children ages 12 years and under on boats under 19 feet in length.

Changing behavior for life jacket use requires rules, availability of equipment, and encouragement from adults through expectations and role modeling—similar to putting on a seatbelt when getting in the car. Children ages 15 years and under have been shown to be more likely to wear a life jacket if at least one adult accompanying them is wearing one.[8] Life jackets should be considered normal gear to be worn when on or in the water. Efforts that make life jackets more appealing to teens and children should be supported in order to reduce the stigma that life jackets are "not cool" or the belief that they are unmanageable when swimming.

There are at least six documented instances in which Washington children have unintentionally fallen into open water while wearing loaner life jackets from local programs. These children were uninjured in <u>all</u> cases.

Life jacket loaner programs are in place in over 50 parks and boat launches in Washington. These loaner programs should be expanded to other parks and water recreation areas, and evaluated.

Increase Close and Constant Adult Supervision

> ***Billy, 4 years old, went to the park with his 10-year-old sister. Billy ran off to play and was later found drowned in a nearby creek.***

Children need to be watched at all times by an adult when in or near the water. Active monitoring when children are in or near water is crucial in preventing child drowning deaths. It can take only 20 to 60 seconds for a child to submerge without warning.[9] Submersion is usually quick and quiet, especially among younger children. Preventing child drowning deaths requires abilities not generally appropriate for children (for example, constant attention, swimming and rescue skills, and strength). Further, children "supervising" other children can be traumatized by guilt about a drowning death that occurs while under their care.

Supervisors of children in or near water should be adults or trained lifeguards. Supervisors should:

- Be sober.
- Be completely focused on the child.
- Be able to swim.
- Have rescue capability.
- Be trained in cardiopulmonary resuscitation (CPR).
- Be alert to all nearby water.
- Have a cell telephone or know the location of the closest phone to call for help if needed.
- Be within arm's reach or close enough to provide immediate rescue.
- Consider all containers, buckets, tubs, pools, ponds, creeks, puddles, or other water environments to be potentially hazardous to children.

Parties or other times when there are groups of adults and children together pose a hazard when the adults are not specifically watching. "Designated water watchers" may reduce risk by ensuring that specified adults are dedicated to watching children near or in the water at all times during social events. The number of children supervised by one adult should be limited to allow for adequate supervision as described above.

Lifeguards provide trained, attentive supervision in many public and other nonprivate residential swimming locations. As one-third of all child drowning

deaths occurred in public parks, lifeguards should be made available whenever possible to reduce the risk of child drowning deaths in all of those areas. Lifeguard practice should follow guidelines of the Centers for Disease Control and Prevention on "Lifeguard Effectiveness" to minimize distractions to lifeguards while on duty.[9] Lifeguard staffing in the summer should include the hours between 12 noon and 8 p.m. to ensure a safe swimming environment for Washington children.

Children and adolescents with a history of seizure disorder are at particular risk and need close monitoring and supervision when bathing or when in or near the water. Of those child drowning deaths reviewed by CDR, seven (ten percent) either had a history of seizure disorders or seizure was listed on the death certificate. Four of those seven children were in a hot tub or bathtub at the time the drowning occurred. A child can drown in as little as two inches of water. If a child has a seizure while bathing, and is not attended by an adult, he/she can drown in very little time.[10]

Recommendation #2: Create Physically Safe Water Environments

Key Findings:

- Four children drowned while playing near or trying to reach a buoy or floating dock.
- None of the pools or wading pools where a child drowned had locked four-sided fencing around the pool.[11]
- Five of the seven swimming/wading pool deaths occurred to children ages 5 years or less.
- Five of the seven pools were private and two were public pools.

The Washington State Building Code Council should adopt the National Uniform Building Code standards requiring four-sided fencing for pools. Most of Washington's pool-related deaths occurred in children ages 5 and under. Other states have adopted regulations that create barriers to private pools in order to protect young children.

Rachel, 3, was playing in the neighbor's yard while her father visited. Rachel wandered off and was found a few minutes later in the bottom of the neighbor's pool, which was not fenced on all sides.

Ensure that children do not have easy access to private pools, wading pools, hot tubs/spas, and decorative or farm ponds. The majority of pools that children drowned in were privately owned and none were adequately secured with a fence and locked gate.

Remove objects that attract children into unsafe water. Buoys or floating docks that appear within reach but in fact are far from shore provide a temptation, especially for teens. In one example, local officials had a buoy placed further away from a bathing beach as several individuals drowned attempting to swim to the buoy. No drowning deaths have occurred since the buoy was moved over 4 years ago; now people know they cannot reach it.

Recommendation #3: Encourage Policies and Regulations That Emphasize Water Safety

Key Findings:

- One-third of all the childhood drowning deaths reviewed occurred in parks.
- Of the 67 child drowning deaths reviewed by the Child Death Review teams, six of the children were boating at the time the drowning occurred. None of those children were wearing a personal flotation device.
- CDR local teams determined that alcohol and/or illicit drugs were associated with 20 percent of the deaths in the group ages 15–17 years.[12]

Develop health and safety requirements for outdoor bathing beaches, similar to those currently in place for regulated facilities (pools, spas, water parks). Some suggested provisions for bathing beach health and safety requirements include specifications on beach design, location, supervision requirements, and other life safety issues.

Upgrade Washington State's Law which currently requires children ages 13 years and under to wear life jackets in boats under 19 feet to match recommendations of the U.S. Coast Guard. The U.S. Coast Guard recommends that a life jacket be worn by people of all ages at all times while any recreational vessel is underway.

Mandate boater education. The average number of boating incidents (150), fatalities (30) and serious injuries (67) has remained about constant in Washington for the last 15 years. The 2003 report, "Recreational Boating Safety in Washington: A Report on methods to Achieve Safer Boating Practices" recommends that completing and passing a course on boating safety be a requirement for most recreational boaters in Washington, and that it be mandatory for operators of motor drive vessels on 10 hp or more.[13] States that have implemented mandatory boater education show a decrease in incidents and all levels of injuries.

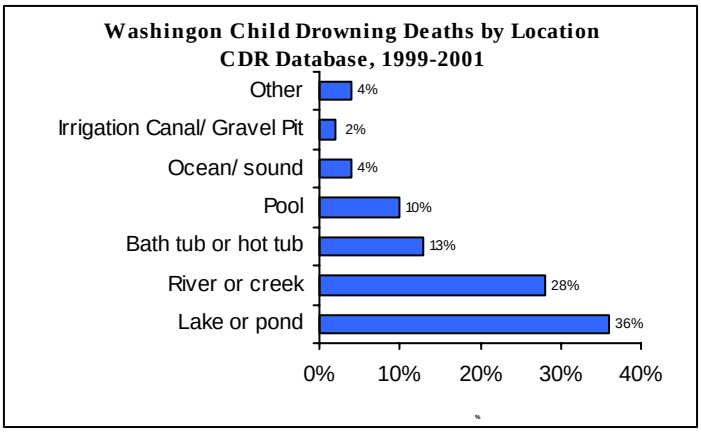
Recommendation #4:
Raise Community and Personal Awareness of Child and Teen Drowning Risk Factors and Prevention Safety Strategies

Key Findings:

- The majority (69 percent) of child drowning deaths in Washington occurred in open water such as lakes, ponds, rivers, creeks, and the ocean.
- Open water drowning deaths of Washington children steadily increase starting in May and peak in August.
- Forty percent of child drowning deaths reviewed occurred between 3 and 7 p.m.
- One-third of all the childhood drowning deaths reviewed occurred in a park.
- Asian/Pacific Islanders make up 7 percent of Washington's population ages 0–17, yet accounted for 18 percent of the drowning deaths in that age group from 1999–2001.
- In seven of the childhood drowning deaths, there were signs in the area warning of hazardous water conditions.[14]
- Of the 67 deaths reviewed, four children were known to have had previous swimming lessons and seventeen were reported to be able to swim.[15]

Detailed information about Washington-specific risk factors for drowning deaths is essential for designing activities to prevent those deaths. In Washington, children are more likely to drown in open water, which, due to the cool temperatures involved, create unique challenges for drowning prevention. Ensuring that the community, parents, and children are aware of these drowning risk factors and safety strategies are available to address them is a key step in reducing the number of drowning deaths in our state.

Figure 3: Drowning Location, CDR Database, 1999-2001



Specific recommendations include the following:

Enhance swimming lesson curriculums to include swimming and survival in open water environments. Students should be prepared for the hazards and special requirements of swimming in these areas, including learning about survival strategies and how to deal with certain hazards.

- Survival strategies that could be addressed include how to:
    - Assess the water environment and accurately estimate distances to avoid swimming in dangerous situations.
    - Assess the skill and endurance of the swimmer (for example, can the swimmer tread water for ten minutes?).
    - Swim in clothing.
    - Swim in moving water.
- Potential hazards important to include in a training include water temperature, weather changes, sudden drop-offs, submerged hazards, and river or rip current issues.
- Highlight the value of swimming in life guarded areas.

Include a comprehensive parent component with swimming lessons curriculum to help promote and reinforce:

- The importance and meaning of close and constant supervision.
- The need for supervision even as a child gets older and learns to swim.
- The need for survival strategies as part of swim instruction.
- The usefulness of life jackets in, on, around water, and
- The need for life jackets regardless of swim ability.
- Training in CPR.

Increase the Skills of Teens to Assess Their Own Risk. Drowning prevention education should emphasize the specific risk to teens in our state. Because one-third of these teens were with other adolescents at the time of their drowning, teens need more than the admonition, "never swim alone," to ensure safe swimming activity. Swimming ability was often not known at the child death review but there were several cases where the teen was known to be a poor swimmer.

Teens may have a false sense of security if they are with their friends, yet peers are not necessarily good swimmers, may not be strong enough to perform a rescue, or

may not be attentive enough to be of assistance in an emergency. Every teen who goes in or near the water needs to have the skills to assess the water environment and evaluate his or her individual swimming ability as noted above in order to make good decisions about getting in the water. Caregivers should ensure that teens have established these assessment skills before allowing them to attend unsupervised trips to water environments. Public and private swimming pools should offer swim lessons specifically for teens.

Develop and implement culturally competent water safety education campaigns to reach ethnically and racially diverse populations and begin state and local drowning prevention campaigns in April or early May and run them through the summer. Campaign efforts can include educational materials, outreach through special events and classroom learning, life jacket loan programs, discount life jacket coupons, life jacket fittings and sales, and media and publicity promotions. The Washington State Drowning Prevention Network, SAFE KIDS, and local drowning prevention coalitions help coordinate and support these campaigns.

CDR data on drowning in Asians and Pacific Islanders was used in an article in the North-west Asian Weekly to alert families about drowning risks.

Evaluate the effectiveness of using warning signs to prevent drowning incidents. Evaluating sign effectiveness would include answering the following questions:

- Are warning signs routinely read, understood, and followed?
- What information is most useful and valuable?
- What is the visual effect of the current signage? For example, does using common colors and design increase its visibility and effectiveness?
- What are the most effective ways to use warning signs to prevent drowning incidents?
- Are the signs used consistently and effectively throughout the state?

Recommendation #5: Support Standardized Drowning Death Investigation Procedures and Improve Data Collection Efforts

Key Findings:

- Sixty-six of the 67 child drowning deaths were referred to a medical examiner or coroner.
- In counties with Medical Examiners, 31 of 33 cases (94 percent) were autopsied, compared with 15 of 29 (52 percent) in counties with coroners and 2 of 5 (40 percent) of counties with prosecutor-coroners.
- Of all drowning deaths reviewed, 41 of the 67 (61 percent) children who drowned were known to have toxicology screens completed. In counties with Medical Examiners, 25 of 33 (76 percent) of the cases were reported to have had a toxicology screen, compared with 15 of 29 (52 percent) in counties with coroners and 1 of 5 (20 percent) in counties with prosecutor-coroners.
- Some drowning questions were commonly left unanswered by the local CDR teams due to a lack of available and accurate data. For example, information on ability to swim and swimming lessons was missing in 33 percent and 62 percent of the deaths reviewed.

Establish criteria to determine when an autopsy should be performed in drowning fatalities. By law, all drowning deaths are referred to a county medical examiner or coroner for investigation but the criteria for autopsy varies from county to county. Although sixty-six of the 67 child drowning deaths were referred to a medical examiner or coroner, autopsy rates were inconsistent. Autopsy information can improve drowning prevention efforts by providing a fuller picture of the circumstances leading up to the drowning.

Toxicology screens when possible should be standard practice when investigating drowning fatalities of children ages 10 years and older. Alcohol use can impair judgment and coordination and studies have found that alcohol use is associated with 25–50 percent of adolescent and adult drowning deaths.[16] Improved data on impairment by alcohol or drugs will aid in identifying risk factors surrounding these deaths, in the hope of preventing additional child drowning deaths. Information regarding toxicology was inconsistently available to the CDR local teams.

Consistent investigations by local public health agencies of licensed facilities (pools, spas, and water parks) should occur following drowning and near-drowning events. There is currently an investigation form and process that evaluates

factors that may have led to the drowning or could prevent future incidents. The investigators determine whether standards are met with regard to fencing, water clarity, supervision, lifeguard certifications, emergency phones, and many other life safety issues. The licensing standards for swimming pools and subsequent oversight appear to be effective in preventing some drowning deaths.

Explore data linkages between entities that gather data on drowning deaths. Washington State Parks Boating Program and the U.S. Coast Guard compile boating accident report forms on all boating related fatalities, significant injuries, and property damage. The Army Corps of Engineers also collects information that could be incorporated into CDR data. The CDR Data Form should be revised to include this and any other information that might be valuable in preventing child drowning.

PRIORITY: PREVENT DROWNINGS AND NEAR-DROWNING RELATED INJURIES

What Can We Do To Prevent Childhood Drownings?

Parents and Caregivers

Increase close and constant supervision of children and teens around water. Supervising around water means that the supervisor is focused on the children at all times and not distracted by doing other things, is sober, can swim, can rescue the children, knows where the nearest phone is, and is within an arm's reach or close enough to provide immediate rescue.

Increase the use of life jackets among children, teens, and adults.

Teach children to swim and continue to supervise them around water and promote life jacket use.

Swim in public places in the presence of certified lifeguards if available.

Learn CPR.

Parents of children with seizures should never leave a child of any age unattended when bathing or when in or near the water.

Caregivers should have firm water safety rules with clear consequences if a child uses alcohol or drugs around water, and adults need to model safe water practices, including sobriety while around water.

Educators, Health Providers and Social Service Providers

Expand swimming lessons to include dealing with open water hazards and swim survival skills. Provide swimming lessons for teens and young adults.

Develop culturally competent drowning prevention campaigns focused on specific risks and prevention strategies. Educational materials and programs need to reach and be effective for diverse audiences.

Increase awareness and education specific to adolescent drowning risk and prevention.

Encourage health care providers to counsel teens and parents about drowning risks. Health care providers need to learn about drowning risks so that they can encourage risk-reducing decision-making and safe water practices.

Start a life jacket loan program in your community. There is information on starting loan programs at www.seattlechildrens.org/dp.

Encourage swimming pools and lifeguarded beaches to have policies that allow children to wear life jackets, at least during family swim times. Children need to learn how to use a life jacket, how they fit, and are better protected especially during busy times at pools.

Promote lifeguard availability and promote training programs for people who supervise children around water. People need to be trained on how to respond to a drowning, how to perform emergency care such as CPR and first aid, and how to obtain help.

Law Enforcement

Enforce boating under the influence (BUI) laws.

Provide education when enforcing life jacket laws.

Legislators / Policymakers

Strengthen life jacket laws.

Strengthen boating under the influence laws.

Require four-sided fencing around pools.

ACKNOWLEDGEMENTS

In July 2003, state funding for local Child Death Review teams was discontinued and, in January 2004, the Washington Child Death Review State Committee disbanded. We would like to thank the State Committee members for their hard work and dedication over the years and local team members for their past and continued efforts to review child deaths in Washington. The information collected by these reviews is invaluable in efforts to prevent unexpected child deaths in Washington.

Members of the Washington State Child Death Review Committee participated in the work groups that drafted the recommendations and provided thoughtful review of the information contained in this report. Additional consultation was provided by:

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ENDNOTES

1. Death Certificate Data: Washington State Department of Health, Center for Health Statistics(CHS), 1999-2001.
2. Washington State Injury Prevention and Safety Program: http://www.doh.wa.gov/cfh/Injury/Tables_update.htm
3. Centers for Disease Control and Prevention WISQARS: http://www.cdc.gov/ncipc/wisqars/
4. Note: there is a break between data from 1998 and 1999 data due to changes in mortality classifications with ICD-10.
5. Quan, L., E. J. Gore, et al. (1989). "Ten-year study of pediatric drownings and near-drownings in King County, Washington: lessons in injury prevention." Pediatrics 83(6): 1035-40.
6. Washington State Child Death Review database, 1999-2001. The CDR data contained in this report includes unknowns which, unless otherwise noted, account for less than 10 percent of the responses.
7. Washington State Healthy Youth Survey 2002; Analytic Report. Washington State Office of Superintendent of Public Instruction. Department of Health, Department of Social and Health Services and Department of Community Trade and Economic Development, and RMC Research Corporation.
8. Linda Quan, MD, Elizabeth Bennett, MPH, CHES, Peter Cummings, MD, MPH, Michaela N. Trusty, MS, Charles D. Treser, Ph.D. Are Life Vests Worn? A Multi-regional Observational Study of Personal Flotation Device Use in Small Boats. Washington State Drowning Prevention Network Children's Hospital and Regional Medical Center. drownprev@seattlechildrens.org
9. Lifeguard Effectiveness: A Report of the Working Group. http://www.cdc.gov/ncipc/lifeguard/02_Executive_Summary.htm
10. Diekema, D. S., L. Quan, et al. (1993). "Epilepsy as a risk factor for submersion injury in children." Pediatrics 91(3): 612-6.
11. Four of these pools were not gated; Two were gated and unlocked; The presence of a gate was unknown in one death.
12. Whether the teams reported impairment by alcohol or drugs was a factor in the death was missing in 24 percent of the reviews.
13. "Recreational Boating Safety in Washington: A Report on methods to Achieve Safer Boating Practices" Washington State Parks and Recreation Commission, December 2003
14. Whether there were warning signs present was unknown in 23 percent of the reviews.
15. Information on ability to swim and swimming lessons was missing in 33 percent and 62 percent of the deaths reviewed.
16. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Fact Sheet on Water-Related Injuries.